

Clopyralid Herbicide and Compost

Agriculture and Natural Resources Fact Sheet #538

What happens when you compost materials that have been treated with an herbicide or pesticide? Normally the composting process breaks these chemicals down and there is neither a chemical trace remaining nor any biological activity. Unfortunately, this is not the case with some persistent herbicides, most notably clopyralid (pronounced clo-PEER-uh-lid) and picloram (a related compound).

Why is Clopyralid Used?

Clopyralid is an herbicide used to control broadleaf weeds in lawns and many agricultural crops, including turf grass and cereal grains. The chemical kills clover, thistle and dandelions. Clopyralid is manufactured by Dow AgroSciences and sold under many brand names (for example, Confront, Stinger, Transline, Curtail, and Redeem R&P). This compound is a synthetic version of the family of plant hormones called auxins. Similar to most physiologically active compounds, auxins are toxic at high concentrations; plants actually grow themselves to death!

In nature, auxins have several roles in plant development, from root growth to fruit set to leaf drop (abscission). Clopyralid interferes with normal plant growth by being present in higher concentrations than natural auxins and by binding to the normal auxin binding sites within plants. Clopyralid remains in plant tissues longer than natural auxins, causing the abnormal growth patterns observed with plants exposed to clopyralid.

What Will I See?

Plants damaged by clopyralid will show:

1. Loss of apical dominance meaning the main growth tip stops growing and the lateral buds begin to grow.
2. Reduced fruit set.
3. Cupping of leaves.
4. Failure of secondary leaves to grow after the seed leaves emerge.
5. In legumes, compound leaves stay single.

See pictures from bioassays conducted by WSU (<http://css.wsu.edu/compost/herbicide/pictures.htm>).



M. Fauci, WSU-Pullman: 5ppb picloram on left, control on the right.

Why is Clopyralid a Problem?

Some garden and commercial crops are extremely sensitive to clopyralid, which is so toxic to some plants that it can harm them at concentrations as low as 3 parts per billion. This is the equivalent of 18 people in the world's population. Clopyralid kills weeds such as clover, thistle, dandelions, knapweed and hawkweed, but also kills peas, beans, tomatoes, potatoes and sunflowers (plants in the Leguminosae, Solanaceae, and Compositae families). In addition, it is extremely persistent! In the soil it has a half life of 2-14 months, when composted it's half life is greater than 1 year (based on WSU experience)!

What Can I Do?

1. Use compost wisely: 20-25% per soil volume, worked in well is ample as a soil amendment (don't plant into straight compost).
2. As a mulch, use only a 1 to 2 inch covering.
3. Realize that many composts continue to be useful and are likely 'clean'. For example, if you make your own compost from known inputs, those containing biosolids (such as Groco and Tagro), and products from companies that are doing bioassays.
4. If buying a commercial compost, ask the producer what measures they are taking to avoid contamination and what tests they have done or are doing on their finished product.
5. Ask your broker / hay or straw grower if clopyralid was used on the hay or straw and if they can give you a written certification that the hay or straw is clopyralid-free.
6. Test your compost (home or purchased) if you are concerned. Chemical tests are expensive (about \$160), so use the WSU bioassay test using beans or peas (<http://css.wsu.edu/compost/bioassay.htm>), or contact the King Conservation District for assistance (206.764.3410).
7. Stay Informed! This is a new issue and is changing daily, including WSDA issuing an emergency rule banning the use of clopyralid on lawns.

Watch the following web sites for updated information:

WA Dept of Agriculture:

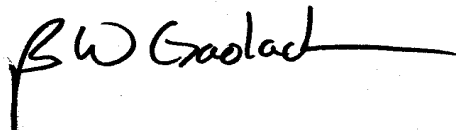
<http://www.wa.gov/agr/pmd>

WSU Compost Team:

<http://www.puyallup.wsu.edu/soilmgmt/Clopyralid.htm>

WSU King County Extension:

<http://www.metrokc.gov/wsucce/agriculture/Toxins.htm>



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